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ABSTRACT

The major purpose of the occupational survey was to identify the skills which are performed and essential for success for a tobacco producer. The specific objectives of this survey were: (1) develop and validate an initial task inventory for the tobacco producer, (2) identify the specific tasks performed by the tobacco producer, and (3) determine the relative importance of the specific tasks to successful employment as a tobacco producer. Procedures included constructing an initial task inventory, validating the initial inventory, selecting a sample of workers, collecting data, and analyzing data from 32 producers in Ohio. The 134 task statements were listed under eight duty areas: (1) liming and fertilizing tobacco crops, (2) controlling weeds, insects, and diseases, (3) establishing and maintaining tobacco plant beds, (4) setting tobacco, (5) topping and controlling suckers, (6) harvesting and transporting tobacco to storage, (7) housing tobacco, and (8) tying, marketing, and shipping tobacco. Half of this report consists of the list of tasks in each duty area followed by the percentage of the sample which performs that task and the average rating of importance for that task (on a scale of 1-3). (HD)

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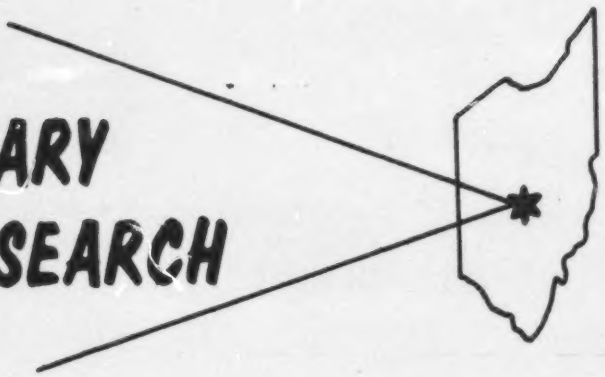
SUMMARY OF RESEARCH



DEPARTMENT OF AGRICULTURAL EDUCATION

The Ohio State University
Columbus, Ohio 43210

TASKS ESSENTIAL TO SUCCESSFUL PERFORMANCE AS A TOBACCO PRODUCER

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INTRODUCTION

Tobacco production in Ohio adds approximately 20 million dollars to the economy each year. Approximately 15 cents per pack of cigarettes sold goes to Ohio in the form of taxes. Ohio farms produce two types of tobacco, burley and cigar. Burley tobacco production is primarily centered in the southern region of the state in the counties of Brown, Adam, Gallia, Highland, Clermont, Scioto and Lawrence. Burley is produced on approximately 9,000 acres. Approximately 2500 acres of cigar tobacco is primarily grown in the western Ohio counties of Darke, Montgomery, Miami and Warren. Effort in this study was concentrated on tasks essential in barley tobacco production.

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TASKS ESSENTIAL TO SUCCESSFUL PERFORMANCE AS A TOBACCO PRODUCER

PURPOSE AND OBJECTIVES

The major purpose of the occupational survey was to identify the skills which are performed and essential for success as a tobacco producer. The specific objectives of this survey were as follows:

1. Develop and validate an initial task inventory for the tobacco producer.
2. Identify the specific tasks performed by the tobacco producer.
3. Determine the relative importance of the specific tasks to successful employment as a tobacco producer.

The study was limited to tasks unique to tobacco production. Therefore, tasks essential in farm management and general crop production were not included.

Definition of the Occupational Area

The tobacco producer usually receives a major portion of his farm income from the sale of tobacco. The particular tobacco type grown on the farm will depend on the locality and the availability of government allotments. The specific duties performed in relation to the tobacco enterprise may include:

1. Liming and fertilizing tobacco crops
2. Controlling weeds, insects and diseases
3. Establishing and maintaining tobacco plant beds
4. Setting tobacco
5. Topping and controlling suckers
6. Harvesting and transporting tobacco to storage
7. Housing tobacco
8. Tying, marketing and shipping tobacco

The tobacco producer has a considerable investment in buildings, equipment and machinery. The tobacco producer will operate machinery and equipment and service and maintain such equipment and machinery. The tobacco producer will also be involved in minor building construction and repair and maintain the buildings and structures.

METHODOLOGY

Objectives were accomplished by constructing an initial task inventory, validating the initial inventory, selecting a sample of workers, collecting data and analyzing data.

Initial Task Inventory

Duty areas and task statements for the tobacco producer were identified by searching existing task lists, job descriptions, curriculum guides and reference publications. Additionally, contacts with several tobacco farmers aided in clarifying the specific responsibilities of the tobacco producer. All the tasks that the project staff thought to be performed were assembled into one composite list. The study was limited to those tasks which were considered unique to tobacco production.

The initial tasks were grouped into functional areas called "duties."

After the task statements were grouped under the proper duty areas, each task statement was reviewed for brevity, clarity and consistency. In all, 132 task statements were included in the initial task inventory.

Worker Sample Selection

An attempt was made to sample practices in two different tobacco producing areas in Ohio with particular emphasis on Gallia and Adam counties. Jim Faust, Vocational Agriculture Instructor, Peebles High School, Adams County, provided a list of approximately 25 Adams County tobacco producers used in the survey. Ohio State University and U.S. Government Agencies along with other vocational agriculture instructors were contacted to obtain a list of additional tobacco producers. A final list of approximately 45 was obtained with approximately 20 tobacco producers from Gallia County and 25 from Adams County.

Data Collection

A packet of materials was sent to the selected tobacco producers. The packet of materials included:

1. A cover letter from David Carter and Tom Pope, Vocational Agriculture instructors, Hannan Trace High School.

2. A questionnaire.

3. A stamped and self-addressed return envelope.

The tobacco producer was instructed to complete the questionnaire and return it in the stamped and self-addressed return envelope by the date specified in the cover letter.

Data Analysis

The 32 questionnaires which were returned were checked for completeness and accuracy by the project staff. Each specific task statement was coded as to whether it was performed (1 = task performed by respondent; Blank = task not performed by respondent) and the level of importance of the task (3 = essential; 2 = useful; 1 - not important). For example, in the duty area of liming and fertilizing tobacco crops, one task was "Take Soil Sample Correctly":

a) 23 of 32 or approximately 77% indicated they performed this task.

b) 16 respondents said they felt this was essential for the student to know.

c) 10 respondents said they felt that it would be useful.

d) No respondents said this task was not important.

In this particular task, the mean level of importance was calculated to be 2.65.

The mean level of importance was calculated using the following formula:

$$M = \frac{3X + 2Y + Z}{N}$$

Where - M = Mean
X = No. of "essential" responses
Y = No. of "useful" responses
Z = No. of "not important" responses
N = No. of responses

FINDINGS

Objectives of the study were met by compiling basic sample background information, determining tasks performed by the tobacco producer and identifying tasks essential to successful performance as a tobacco producer.

Description of the Sample

Information regarding the performance of tasks and the importance of the tasks to the successful production of tobacco was obtained.

Response to the Survey

A total of 45 questionnaires were mailed and 32 replies were received. This represented a 71% rate of return. The response to the questionnaire is summarized in Table 1.

TABLE 1

TOBACCO PRODUCERS RESPONSE TO THE QUESTIONNAIRE

	N	Percent of All Farmers In the Survey
Tobacco Farmers in survey	45	100.00
Total Returns	32	71.1
Usable returns	30	66.6
Unusable returns	2	4.4
Nonrespondents	13	28.8

Tobacco Allotment

Tobacco producers with various size tobacco farms were included in the study. All 30 of the usable surveys included information regarding the size of tobacco allotments. Table 11 summarizes the response to the question, "What size is your tobacco allotment?" Seventeen tobacco producers or 56.6% operated farms with 0-4999 pounds of allotment. Six tobacco producers or 20% operated farms with an allotment of 5000-9999 pounds. Three tobacco producers or 10.0% operated farms with an allotment of 10,000-14,999 pounds. One tobacco producer or 3.4% operated farms with 15,000-19,999 pounds of allotment and three producers or 10.0% of tobacco producer respondents operated farms with tobacco allotments of 20,000 pounds plus. The latter three tobacco allotments included tobacco producers raising 31,000 pounds, 42,000 pounds and 55,000 pounds.

TABLE 11

SIZE OF OPERATION

Acres	N	Percent of Respondents
0 - 4,999	17	56.6
5,000 - 9,999	6	20.0
10,000 - 14,999	3	10.0
15,000 - 19,999	1	3.4
20,000 +	3	10.0
Total	30	100.0
$\overline{X}$ Number of pounds of tobacco allotment		9119.03

YEARS AS A TOBACCO FARMER

Tobacco farmers with varying amounts of experience in tobacco production were included in the study. Table 111 summarizes the responses to the question, "How Many Years Have You Grown Tobacco?" Three tobacco producers or 10.0% had grown tobacco from 1-10 years. Ten respondent tobacco producers had grown tobacco from 11-20 years. They represent 33.3% of all respondents. Fourteen producers or 46.7% had grown tobacco from 21-30 years and three tobacco producers or 10% of all respondents had grown tobacco for over 40 years. The years of experience as a tobacco producer ranged from 1-47 years with a mean of 22.6 years.

Preparation as a Tobacco Producer

Tobacco producers obtained training for their job from various sources. Table IV summarizes their responses to the question "Where Did You Learn to Grow Tobacco?" Respondents could check as many categories as were applicable. Twenty-seven tobacco producers or 90% indicated they received training on-the-job. Eight tobacco producers or 26.6% indicated they had received training through their high school program. Eight tobacco producers or 26.6% of all respondents indicated they received training through adult education programs and four tobacco producers or 13.3% indicated that they had received training in tobacco production from other sources.

TABLE 111

TOTAL AMOUNT OF WORK EXPERIENCE IN TOBACCO

Years	N	Percent of Respondents
1 - 10	3	10.0
11 - 20	10	33.3
21 - 30	14	46.7
40 +	3	10.0
Total	30	100.0

$\bar{X}$ Years as a tobacco farmer = 22.6

Duty Areas of Work Performed By The Tobacco Producer

The 134 tasks were grouped under 8 duty areas. Each respondent indicated whether he performed the specific task in his current position as a tobacco producer. The percentages of respondents performing each task were averaged for all tasks under each duty area. The mean percentage of tobacco producers who performed specific tasks in specific duty areas are presented in Table V.

Duty areas in which 50% or more of the tobacco producers performed the tasks were:

1. Liming and fertilizing tobacco crops
2. Controlling weeds, insects and diseases
3. Establishing and maintaining tobacco plant beds
4. Setting tobacco
5. Topping and controlling suckers
6. Harvesting and transporting tobacco to storage
7. Housing tobacco
8. Tying, marketing and shipping tobacco

TABLE IV

SOURCE OF TRAINING RECEIVED AS A TOBACCO PRODUCER

Source	N	Percent of all Employees in the survey
On-the-job	27	90.0
High School Program	8	26.6
Technical School Program	0	0.0
College/University Program	8	26.6
Adult Education Program	0	0.0
Other	4	13.3

Duty Areas of Work Essential For Successful Performance as a Tobacco Producer

The level of importance rating was obtained for each task. The respondent could rate the task as essential, useful, or not important for successful performance as a tobacco producer. A ranking of essential was assigned a numerical rating of "3", useful a numerical rating of "2", and not important a numerical rating of "1". The level of importance ratings for each task were averaged for all tasks under each duty area. The average level of importance rating for the specific tasks in the specific duty areas are presented in Table V.

Percentage Performance and Level of Importance Ratings of Specific Tasks

The percentage performance by incumbent workers and the level of importance for each specific task is also presented in Table V.

It is recommended that the results for each specific task be examined by educators and others who are developing educational programs to determine curriculum content for preparing tobacco producers. Specific tasks with a high level of performance and a high importance rating should be given more emphasis in the educational program than a specific task with a low level of performance and a low level of importance rating. Previous experience has shown that a task with 50 percent of the incumbents performing it and with an importance rating of 2.3 or higher should be considered for inclusion in the curriculum.

TABLE V

PERCENTAGE PERFORMANCE AND AVERAGE RATING OF IMPORTANCE OF SPECIFIC TASKS*

TASK STATEMENTS	Percent Performing	Average level of Importance
LIMING AND FERTILIZING TOBACCO CROPS		
Take Soil Sample Correctly	.77	2.65
Take Tissue Sample Correctly	.20	2.05
Correctly Complete Forms For Samples	.63	2.58
Prepare Soil Sample To Be Submitted	.73	2.63
Prepare Plant Sample To Be Submitted	.17	2.12
Interpret Plant Tissue Results	.13	2.00
Interpret Soil Sample Results	.63	2.77
Determine Amount of Fertilizer to Apply	.80	2.73
Determine Analysis of Fertilizer to Apply	.86	2.65
Determine When to Apply Fertilizer and Lime	.80	2.66
Evaluate Effect of Lime on Crop Production	.77	2.62
Determine Amount of Lime to Apply to Raise Soil PH	.60	2.55
Identify Nutrient Deficiency Symptoms of Tobacco	.60	2.75
Calibrate Fertilizer Equipment	.67	2.57
MEAN RATING	59.7	2.52
CONTROLLING WEEDS, INSECTS AND DISEASES		
Identify Common Diseases of Tobacco	.83	2.59
Identify Common Insects of Tobacco	.86	2.55
Identify Damage Caused by Insects and Diseases	.73	2.44
Apply Chemicals to Control Insects, Weeds and Diseases	.63	2.59
Determine Amount of Chemical to Apply	.73	2.81
Identify Common Tobacco Weeds	.67	2.43
Inspect Fields to Determine When to Control Weeds	.67	2.65
MEAN RATING	73.1	2.58

*Average Rating of Importance may range from 1-3 with 3 being the highest.

TABLE V (Cont.)

TASK STATEMENTS	Percent Performing	Average Level of Importance
ESTABLISHING AND MAINTAINING TOBACCO PLANT BEDS		
Select Bed Site	.93	3.00
Select Variety	.86	2.83
Determine Type of Canvas to Use	.83	2.28
Calculate Cost of Establishing the Bed	.73	2.43
Determine When to Seed Bed (Time of Year)	.86	2.77
Prepare Bed for Seeding	.90	2.96
Seed the Bed (Method)	.83	2.85
Determining Method of Seed Control	.77	2.50
Select Analysis and Type of Fertilizer	.90	2.76
Water the Seed Bed	.86	2.81
Inspect Bed for Insect Damage	.90	2.93
Compact the Bed Soil after Seeding	.70	2.29
Identify Insects Damaging the Bed	.83	2.64
Place the Methyl Bromide Containers	.43	2.45
Determining the Number of Methyl Bromide Containers to Use	.53	2.57
Identify Advantages of Fall Preparation of Bed	.70	2.44
Installing Tobacco Canvas	.83	2.70
Evaluate Burning the Bed	.77	2.48
Select and Apply Insecticides	.60	2.56
Place Straw on Bed to Elevate Canvas	.33	1.83
Ditch Bed to Prevent Erosion	.83	2.67
Weed Tobacco Bed	.70	2.86
Remove Canvas for Pulling Plants	.90	2.96
Determine Number of Plants Required/Acre	.73	2.44
Transport Plants for Setting	.90	2.69
Identify Plant Bed Diseases	.77	2.65
Contact Proper Authorities for Solution to Problems	.77	2.68
Treat Plant Bed Diseases	.70	2.74
Install Canvas Supports (Logs, Bottles, Jugs, etc.)	.77	2.48

TABLE V (Cont.)

TASK STATEMENTS	Percent Performing	Average Level of Importance
ESTABLISHING AND MAINTAINING TOBACCO PLANT BEDS (Cont.)		
Pull Plants with Least Amount of Bed Damage	.83	2.93
Select Plants to Correct Size	.83	2.74
Determine When to Harden-off or Toughen Plants	.86	2.68
Apply Nitrate to Beds	.67	2.42
Destroy Bed when Completed	.73	2.19
Seed Beds to Soybeans when Finished	.50	2.00
Plan Beds for Next Year	.67	2.38
Select Hybrid Seeds	.77	2.46
MEAN RATING	75.7	2.59
SETTING TOBACCO		
Determine Number of Plants to Set Per Acre	.70	2.42
Evaluate Plant Spacing	.80	2.64
Determine Depth to Set Plants	.83	2.76
Handle Plants without Bruising	.86	2.88
Store Plants to Maintain Freshness	.80	2.85
Adjust Water Amounts on Setter.	.80	2.81
Determine Cost of Setting Tobacco by Machine	.43	2.04
Place Plants Correctly in Setter "Fingers"	.77	2.96
MEAN RATING	74.9	2.67
TOPPING AND CONTROLLING SUCKERS		
Determine When Plant is Ready to Top	.93	2.86
Select Topping Method (Knife, Break, Etc.)	.83	2.55

TABLE V (Cont.)

TASK STATEMENTS	Percent Performing	Average Level of Importance
TOPPING AND CONTROLLING SUCKERS (Cont.)		
Top to Correct Height	.90	2.74
Discuss Advantages of Sucker Control	.70	2.52
Determine Methods of Sucker Control	.83	2.70
Apply Sucker Control	.83	2.60
Interpret Spray Results	.70	2.30
Calculate Cost of Spraying	.67	2.11
Calculate Cost of Hand Suckering	.53	2.11
Calculate Amount of Spray to Apply	.77	2.71
MEAN RATING	76.9	2.52
HARVESTING AND TRANSPORTING TOBACCO TO CURING BARN		
Determine When Tobacco is Ripe	.83	2.66
Determine Amount to Harvest at One Time	.93	2.73
Select Harvest Pattern	.80	2.44
Calculate Harvesting Costs	.67	2.29
Follow Weather Forecasts	.77	2.29
Lay Out Sticks	.83	2.38
Sharpen Cutting Blades	.86	2.53
Select Equipment to Cut	.83	2.58
Select and Sharpen "Spuds"	.86	2.45
Place "Spud" on Stick	.90	2.74
Cut Tobacco Safely and Efficiently	.86	2.79
Place Tobacco Correctly After "Spudding"	.80	2.81
Determine Number of People Required to Harvest	.67	2.50
Calculate Number of Sticks Needed	.83	2.57
Select Good Sticks	.80	2.50
Select Harvesting Equipment	.73	2.50
Prepare Wagons for Harvest	.63	2.58
Load Wagon Correctly	.83	2.70
Carry Tobacco Correctly	.83	2.65
Construct Tobacco Trailer	.33	1.92

TABLE V (Cont.)

TASK STATEMENTS	Percent Performing	Average Level of Importance
HARVESTING AND TRANSPORTING TOBACCO TO STORAGE (Cont.)		
Determine Number of Stocks/stick	.73	2.42
"Spud" Tobacco	.70	2.71
Place Tobacco on Ground After Spudding	.50	2.00
After Harvest, Seed Tobacco Land with Small Grain.	.70	2.25
MEAN RATING	75.9	2.50
HOUSING TOBACCO		
Tier Tobacco Barn	.86	2.96
Hang Tobacco	.90	3.00
Space Tobacco on Poles - Rails - Tier Rail	.90	2.93
Remove Tobacco From Wagon	.90	2.93
Hand-up Tobacco in Barns	.90	2.93
Remove Dirt and Mud from Crop	.56	2.41
Select Safe Tree Varieties to Tier Barn	.80	2.62
Install Barn Fans for Air Movement	.33	2.18
Construct Vents in Storage Buildings to Allow Air Movements	.47	2.54
Watch for Environmental Factors Affecting Tobacco in Barn (Houseburn, Rot, Etc.) and use Proper Ventilation	.56	2.76
Check for Broken Tier Rails Periodically	.70	2.68
MEAN RATING	71.6	2.72
TYING, MARKETING AND SHIPPING TOBACCO		
Calculate Expected Returns and Profits on Sales	.67	2.32
Strip Tobacco	.83	3.00
Grade Tobacco	.80	2.92

TABLE V (Cont.)

TASK STATEMENTS	Percent Performing	Average Level of Importance
TYING, MARKETING AND SHIPPING TOBACCO (Cont.)		
Determine When Tobacco is in "Case" (Moisture)	.80	2.92
Bulk Down Tobacco	.83	2.88
Evaluate Influence Tobacco Quality has on Value	.63	2.55
Prepare Carriers for Hauling Tobacco Crop	.63	2.48
Load Tobacco	.83	2.76
Select Markets	.60	2.50
Determine Correct Marketing Time	.70	2.36
Maintain Tobacco in Good Case	.77	2.74
Basket Tobacco at Market	.63	2.58
Prepare Advertising Announcements for Sale of Tobacco	.20	1.71
Inspect Tobacco for Color, Maturity, Foreign Matter and Leafiness	.56	2.54
Cover Tobacco on Truck	.83	2.88
Tie Tobacco Hands	.80	2.81
Press Tobacco	.83	2.66
Determine Feasibility of Participating in Tobacco Sales Contracts	.30	2.14
Press Cigar Tobacco	.30	2.53
Wrap Cigar Tobacco	.36	2.47
Grade Cigar Tobacco	.36	1.95
Market Cigar Tobacco	.40	2.76
Install Correct Lighting System	.60	2.62
MEAN RATING	62.0	2.57

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SUMMARY OF RESEARCH SERIES

The content of the curriculum of Vocational Education in Agriculture is based upon what students need to know in order to succeed in their chosen occupation. In certain areas of Ohio tobacco is grown as a major cash crop. Students preparing to farm in such areas need to be taught the essential elements of tobacco production. In this study, the authors report a occupational survey in which the competencies for tobacco production are rated by farmers. The data from this study will be useful to curriculum developers and teachers.

This summary is based on an independent study conducted as part of Master of Science Programs by David M. Carter and J. Thomas Pope under the direction of J. David McCracken. Messrs. Carter and Pope are currently vocational agriculture teachers at Hannan Trace High School in Gallia County, Ohio. Dr. McCracken is an Associate professor in the Department of Agricultural Education at The Ohio State University. Special appreciation is due Dr. Harold R. Binkley, University of Kentucky; Dr. Richard H. Wilson, The Ohio State University; and Mr. George Rhonemus, teacher of vocational agriculture, Manchester, Ohio for their critical review of this manuscript prior to its publication.

Research has been an important function of the Department of Agricultural Education since it was established in 1917. Research conducted by the Department has generally been in the form of graduate theses, staff studies and funded research. It is the purpose of this series to make useful knowledge from such research available to practitioners in the profession. Individuals desiring additional information on this topic should examine the references cited in the bibliography.

J. Robert Warmbrod, Professor
Chairman, Department Research Committee

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